F.C.C. 76-242

BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D. C. 20554

Docket No. 19528

In the Matter of

PROPOSAL FOR NEW OR REVISED CLASSES OF INTERSTATE AND FOREIGN MESSAGE TOLL TELEPHONE SERVICE (MTS) AND WIDE AREA TELEPHONE SERVICE (WATS)

Second Report and Order

(Adopted: March 18, 1976; Released: March 18, 1976)

BY THE COMMISSION: COMMISSIONER HOOKS DISSENTING AND ISSUING A STATEMENT; COMMISSIONER QUELLO DISSENTING.

1. In a First Report and Order herein (First Report), released November 7, 1975, 56 FCC 2d 593, the Commission established a registration program designed to allow users of the nationwide telephone network to connect terminal equipment other than PBXs, key telephone systems, main station telephones, and coin telephones to the network without the need for carrier-supplied connecting arrangements, provided they comply with the standards incorporated in the registration program to protect the network from harm. The standards and registration procedures are contained in a new Part 68 of the Commission's Rules.

2. While the Commission was tentatively of the view that main telephones, private branch exchange (PBX) equipment, and key telephone (KT) equipment presented no valid distinction as to potential for "harm," compared with equipment already within the scope of Part 68 (*see* First Report, paragraph 18), it offered parties to this proceeding an additional opportunity for further comment on their

inclusion.[1] Comments were received from telephone companies (the Bell System Companies (hereinafter, AT&T), GTE Service Corporation and affiliated telephone companies (hereinafter, General), United Systems Service, Inc., (and Continental Telephone Corporation) and their trade associations (National Telephone Cooperative Association; United States Independent Telephone Association); the United States Department of Justice; the Rural Electrification Administration (REA); the North Carolina Utilities Commission (NCUC); user groups (Association of American Railroads, Utilities Telecommunications Council, American Petroleum Institute, and Ad Hoc Telecommunications Committee); and equipment manufacturers and their trade associations (North American Telephone Association, Computer and Business Equipment Manufacturers Association, the Electronic Industries Association, International Telephone and Telegraph Corporation, Danray, Inc., Com-Path Division of Scott-Buttner Communications, Inc., and DASA Corporation).

3. The comments listed in paragraph 2 above, fall into two general categories: *first,* there are comments which argue that it is inappropriate to include main station telephones, PBXs and key telephone systems within the scope of the FCC's registration program, and *second,* there are comments which argue that the Part 68 rules must be modified before including such equipment in the program.

4. Following the filing of these comments, the Federal-State Joint Board, on February 25, 1976, adopted a Recommended Second Report and Order, which recommended that main telephones, key telephone systems, and PBX equipment not be included in the registration program adopted by the Commission in its First Report and Order in this proceeding. This recommendation was based solely on the Joint Board's general fears concerning possible revenue losses the telephone companies may suffer as a

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[1] *See* 56 FCC 2d 626 (1975).

result of competition in the terminal equipment field—not on any asserted danger of technical harm to the network.

Delineation of the Issues

5. The matter now before the Commission is a direct outgrowth of, and falls within the overall policy framework established by, the Commission's *Hush-A-Phone* and *Carterfone* decisions.[2] In *Hush-A-Phone* the Commission ruled, pursuant to judicial guidelines, that:

> In addition to invalidating the defendants' foreign attachment tariff regulations insofar as they bar the use of the Hush-A-Phone device, an inescapable consequence of the Court's opinion is to render such tariff regulations unjust and unreasonable *insofar as they may be construed or applied to bar a customer from using other devices which serve the customer's convenience in his use of the facilities furnished by the defendants and which do not injure the telephone companies' employees or facilities, or the public in the use of defendants' services, or impair the operation of the telephone system. As we construe the Court's opinion, a tariff regulation which amounts to a blanket prohibition against the customer's use of any and all devices without discriminating between the harmful and harmless encroaches upon the right of the user to make reasonable use of the facilities furnished by the defendants.* Such a regulation goes beyond what is reasonably required in the interest of protecting the defendants' employees, facilities, the telephone system and the public from adverse effects. (emphasis supplied) 22 FCC 112, 113-114 (1957).

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[2] *Hush-A-Phone Corp.* v. *U.S.*, 99 U.S. App. D.C. 190, 238 F.2d 266 (D.C. Cir. 1956); *Carterfone*, 13 FCC 2d 420 (1968), reconsideration denied, 14 FCC 2d 571 (1968); *see also, Interstate and Foreign Message Toll Telephone, etc.*, 56 FCC 2d 593, 594-96 (1975).

6. In *Carterfone*, the Commission applied the same basic principles in ruling that a device used to interconnect mobile radio systems to the interstate and foreign message telecommunications system filled a need, that its use did not adversely affect the telephone system, and that the AT&T tariff prohibiting its use was unreasonable and unlawful within the meaning of Section 201(b) of the Communications Act of 1934. The Commission also made it clear that the *Carterfone* decision was not limited to the Carterfone device *per se*, but was rather a broad general policy.[3]

7. Pursuant to the *Carterfone* decision, AT&T filed tariffs (in which its connecting carriers concurred) which generally allowed the interconnection of all types of customer-provided terminal equipment, provided that direct electrical connection would be accomplished only through carrier-supplied "connecting arrangements," (interface devices designed to protect the network from technical harm). Without ruling as to the necessity for or lawfulness of the tariff requirement that carrier-supplied connecting arrangements be employed, the Commission allowed the Carterfone tariffs to go into effect. Thus, since 1968, customers have been accorded the right pursuant to *Hush-A-Phone* and *Carterfone* to provide their own terminal equipment of all types, and independent manufacturers and distributors have been afforded the opportunity to supply such equipment to the public in competition with the vertically integrated telephone industry.

8. In recognition of the fact that the post-Carterfone tariff conditions continue to impose certain restrictions on both the customer and the independent supplier of terminal equipment, the Commission at the same time instituted informal proceedings to obtain technical and operational data to assist its evaluation of the public interest factors involved in the possible liberalization of the network control

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[3] The parties recognized this and themselves argued on a broad policy basis. *See, Carterfone*, 13 FCC 2d at 425 (1968).

signalling unit and connecting arrangement provisions of the revised tariffs. Further, on June 14, 1972, the Commission instituted this proceeding by Notice of Inquiry and Proposed Rulemaking, 35 FCC 2d 539 (1972), to determine whether and under what terms, conditions, or limitations the interstate MTS and WATS tariffs should be revised to allow customers to have the option of furnishing any needed network control signalling units and connecting arrangements (or the functional equivalent thereof), and to determine what rules, if any, the Commission should adopt with respect to the foregoing.

9. On November 7, 1975, after lengthy proceedings in this Docket, the Commission issued its First Report and Order, in which it concluded that:

(1) The present tariff provisions requiring the use of carrier-supplied connecting arrangements impose an unnecessarily restrictive limitation on the customer's right to make reasonable use of the services and facilities furnished by the carriers.

(2) They constitute an unjust and unreasonable discrimination both among users (or classes of users) and among suppliers of terminal equipment.

(3) The standards and procedures prescribed for the registration with the F.C.C. of protective circuitry and/or terminal equipment will provide the necessary minimal protection against network harm, which has been specified in various carrier operating procedures and/or the recommendations of the Joint Board and others, and will serve the public interest.

10. While the proceedings in this Docket were continuing, the Commission initiated a broad fact-finding inquiry into the economic implications and interrelationships among a number of industry developments, policies, and practices—some instituted pursuant to regulatory policy, others

carrier-initiated.[4] In its Notice of Inquiry in Docket No. 20003, the Commission stated it would look into the effect of current pricing practices and regulatory policies on the level and distribution of customer charges for various telecommunication services, and in particular on the extent to which various categories of customers are now or will be, under alternative pricing practices and regulatory policies, subsidizing the services received by others. Of particular concern in that proceeding are the comparative economic effects on both overall telecommunications costs and charges and on the costs and charges for different categories of both public and business customers, of such factors as the interconnection and use of customer-provided facilities, the use of specialized common carrier services in lieu of common carrier private line services, the use of flat-rate and other cost-insensitive pricing practices for local exchange services, and the jurisdictional separation of revenues and expenses for plant and facilities commonly used for both intrastate and interstate (including foreign) services.

Discussion

11. The issue now before the Commission in Docket 19528 has thus been clearly delineated as a consequence of prior Commission decisions extending back to *Hush-A-Phone*. The issue is not whether customers should be afforded the opportunity to interconnect their terminal equipment with the telephone network via direct electrical connections. That issue was decided by the Commission and the Courts in *Hush-A-Phone* and *Carterfone;* to the extent that parties may believe it necessary or desirable to revisit those decisions, that is a matter beyond the scope of this proceeding. Nor is the issue one of potential economic impact on the carriers. That issue was also

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[4] ***Economic Implications Relating to Customer Interconnection, Jurisdictional Separations, and Rate Structures,*** **Docket No. 20003, 46 FCC 2d 214 (1974).**

addressed initially and disposed of in the *Carterfone* decision. To the extent that any specific cases of economic harm can be demonstrated, to such an extent as to affect the carriers' ability to continue providing essential public telecommunications services, parties have been and continue to be afforded the opportunity pursuant to *Carterfone* to make such a showing and to seek appropriate relief. To the extent that more general allegations and issues of potential future economic harm are concerned, such matters are being addressed in the Commission's concurrent and broad-ranging economic inquiry, Docket 20003. Thus, the single issue now before the Commission is whether, having adopted a terminal equipment registration program for the reasons cited in its November 7, 1975 First Report and Order, it is reasonable for any valid technical or legal basis, for the Commission to continue excluding PBX's, key telephone systems, and main station telephones from this registration program.

12. Certain parties (primarily the telephone companies) have argued—and the Joint Board has recommended—that main telephones, PBX and KT equipment should remain excluded from the scope of the F.C.C. registration program pending the outcome of the Commission's economic inquiry in Docket No. 20003. As noted above and in the First Report (see paragraphs 18 and 19, and footnote 10 thereto) such considerations do not fall within the scope of the Docket No. 19528 proceedings. From its inception, Docket No. 19528 has been concerned solely with the issue of technical harm. Economic issues, including questions concerning the continued validity of the *Carterfone* decision, are matters which may and are being addressed fully in other proceedings before the Commission without the necessity of delaying the 19528 proceeding. Pursuant to *Carterfone,* parties have been and continue to be afforded the opportunity to demonstrate specific instances of economic harm as a basis for seeking relief from the full application of this policy. To date, only one party has

sought a hearing on this basis, and that hearing was terminated prior to the introduction of evidence, at the petitioner's request.[5]

13. In Docket No. 20003, the Commission has also afforded parties the opportunity to present facts, studies, or opinions regarding both present and future economic effects resulting from a broad range of interrelated economic issues of general applicability (see paragraph 10, above), including, among other things, liberalized interconnection and competition in various sectors of the communications industry. Based on the information gained from this inquiry, we fully expect to institute further rulemaking or other proceedings as appropriate, dealing in a comprehensive and coordinated manner with both the carriers' alleged losses and the public benefits of competition. However, the Commission has made it abundantly clear from the first Notice of Inquiry in Docket No. 20003 that initiation of this proceeding would not necessarily preclude further action in Docket No. 19528. We do not intend, as some parties would have us do, to prejudge the outcome of the Docket No. 20003 inquiry in favor of *any* party. For the purpose of proceeding with Docket No. 19528 it is sufficient to note the absence to date of any showing before the FCC that any actual economic harm has been experienced much less that this has adversely affected any carrier's ability to serve the public. Comments received herein broadly allege some adverse economic impact without quantification.[6] Such allegations are not a demon-

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[5] *Mebane Home Telephone Co.*, FCC 75M-1788 (released October 17, 1975).

[6] GTE cites its allegations in Docket No. 20003 as some indication of the present contribution of PBX and KT equipment to its revenues, without quantifying how much of such contribution is expected to be lost as a result of applying Part 68 to such equipment. GTE merely assumes, without explanation, that 50% of the replacement and growth market would be penetrated by competition. Such assumptions and

stration of expected economic impact sufficient to require that the rights of connecting registered equipment under Part 68 to the telephone network be denied to all telephone subscribers, nationwide.

14. The Joint Board has also experessed concern that we not extend the registration program to PBX, KTS, and main telephones solely to promote competition for its own sake. This clearly is not, and has never been, the Commission's primary objective. The guiding principle in *Carterfone* and related decisions has been to afford the users of the nationwide telecommunications network greater flexibility and choice in their use of that network—through customer-provided terminal equipment—in ways which are privately beneficial without being publicly detrimental. By affording telephone customers more freedom of choice in the provision and interconnection of terminal equipment, the markets for such devices *have* expanded, and price competition and innovation on the part of both the telephone companies and independent equipment suppliers *has* resulted. This competition has increased the utility of the nationwide telephone network, a result which we consider both privately and publicly beneficial—but competition *per se* has not been the Commission's objective. Competition in the terminal market has existed since 1969 when telephone company tariffs filed in response to *Carterfone* permitted connection of customer-supplied equipment through telephone company connecting arrangements. These connecting arrangements (for which a monthly charge is assessed) were never alleged to be necessary as an anticompetitive deterrent to the purchase of non-carrier equipment. Nor were they alleged to be necessary as a surcharge needed to produce revenue "contribution" to the telephone companies. Rather they were alleged to be necessary solely to protect the nation's

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allegations are being thoroughly scrutinized in Docket 20003; but they can hardly be considered sufficient to justify further delay in this long-pending proceeding.

telephone network from any technical harms which non-carrier terminals might produce. The F.C.C.'s registration program does not extend the area of competition; it merely removes what has been found to be an unnecessary and discriminatory carrier-imposed restriction on the manner in which customer-provided equipment may be connected to the network.

15. Some parties (again, primarily the telephone companies) take the position that Part 68 should not be extended to encompass main telephones, PBX and KT equipment as such equipment has a high incidence on the telephone network, and that the present inadequacies of Part 68 would become more acute. This argument is incorrect. First, the Commission's registration program has been drawn to achieve the same result as the telephone companies' own protective devices have achieved since January, 1969. Second, if equipment is actually harmful, the telephone companies have the right to disconnect it from the network by discontinuing service (Section 68.108 of the Rules), and thus actually harmful equipment will not remain connected to the telephone network. Third, to the extent that the technical requirements of Part 68 are inadequate (and in our view this is not the case), interested parties can petition for changes in the Part 68 rules at any time. Alternatively stated, the proper remedy for an allegedly inadequate technical requirement is not to deny the rights of connecting registered equipment under Part 68 to all telephone subscribers indefinitely. Rules often change as requirements change; the purpose of allowing petitions for rulemaking is to accommodate such changed requirements. With regard to the Part 68 technical requirements, it should be noted that many of the changes which Bell has suggested in an amendment to its Petition for Reconsideration, filed January 22, 1976, recommend *less* stringent parameters than are presently contained in Part 68.

16. Another argument is that (in GTE's view) main tele-

phones should not be included as it is important that there be at least one telephone company-provided instrument on the customer's premise to assure compatibility with the telephone network and fulfill the telephone company's "end-to-end" service responsibility. However, the telephone companies have provided connecting arrangements without an associated telephone instrument, and therefore must have themselves concluded that there is no such necessity.[7] Second, in the First Report and Order, compatibility was distinguished from network harm (e.g., *see* paragraph 22, and Section 68.110(a) of the Rules). Third, the telephone companies do not even now have "end-to-end" responsibility where customer-provided equipment is used. They are only responsible for the service which they provide. When a customer chooses to use equipment not provided by the telephone company, the telephone company is only responsible for providing adequate communication line service. Obviously, the telephone company cannot be responsible for the performance of equipment which it does not provide, install and maintain.[8]

17. The telephone companies, and their trade associations, also oppose inclusion of telephone company-provided main station telephones, PBX and KT equipment for the same reasons as were stated in Petitions for Reconsidera-

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[7] F.C.C. Tariffs No. 259 (WATS) and 263 (MTS) impose no requirement for a carrier-supplied telephone instrument in addition to a connecting arrangement for connection of customer-provided terminal equipment and/or systems. Also, the alleged requirement is plainly impractical in the case of PBX trunks (presently used with connecting arrangements) which are not even compatible with a telephone instrument.

[8] Customers who choose to use equipment not supplied by the telephone company assume the risk that this equipment will not perform adequately. Presumably, suppliers of inadequate equipment will not remain in the market for very long. The Rules in Part 68, however, assure that in failing to operate properly, even inadequate equipment will not harm the telephone network.

tion of the First Report and Order. Both the Joint Board, in its Recommended First Report and Order, and the Commission, in its First Report and Order and its Memorandum Opinion and Order on reconsideration thereof (FCC 76-134, released February 13, 1976), have ruled that telephone company equipment should be included in the scope of Part 68. No new arguments have been advanced in support of changing present provisions of Part 68 with regard to telephone company-provided equipment, as applied to main telephones, PBX and KT equipment.

18. Many parties have filed comments addressing the applicability of the technical requirements of the Commission's present registration program to main telephones, PBX and KT equipment. Such parties have pointed out that the specific technical requirements of Subpart D of Part 68 will have to be varied to accommodate certain differences between telephone lines and telephone trunks (trunks are used with PBX equipment). In addition, the comments argue that specific parametric values which are presently contained in Subpart D should be changed to accommodate this equipment. We are addressing these matters below.

19. The general technical standards of Part 68, as presently stated in Subpart D thereof, are applicable to main telephones, PBX and KT equipment. Each of hazardous voltages, longitudinal balance, signal power and leakage currents must remain within stipulated limits to prevent harm. In addition, "pre-trip" and "false trip" must be prevented, except as noted below, and proper operation of billing equipment must be assured. All of the above must occur within foreseeable environmental and electrical stresses to which equipment will be subjected during shipment, installation and use.

20. Improper network control signaling, as the Commission concluded in its First Report and Order, paragraph 22, does not generally require specific protection,

except as it might relate to improper billing, since a failure of network control signaling will adversely affect the user's ability to generate telephone calls and receive telephone calls. The Commission chose, in the First Report and Order, to control one aspect of network control signaling—"pre-trip" and "false trip"— which is dependent upon limitations on on-hook impedance. This was done on the theory that an unknowing caller who attempted to place a telephone call to equipment which caused "pre-trip" or "false trip" would perceive the call as one which failed to go through, and would be expected to continue to attempt to place the call, or involve telephone company maintenance personnel. The rationale for controlling on-hook impedance is equally applicable to main telephones and key telephone systems, as "pre-trip" and "false trip" have been controlled in the past, where such customer-provided equipment, used for both residential and business applications, was connected through carrier-provided connecting arrangements.

21. However, PBXs are only used for business applications, and a failure having the effect of "pre-trip" or "false trip" would render the PBX unable to answer incoming telephone calls. Such a failure would go far beyond inconvenience to the user; it would adversely affect his business. Consequently, such business users would be strongly motivated to both acquire equipment which did not have this effect, and to have offending equipment immediately repaired or replaced. Moreover, since the release of our First Report and Order, we have received no comments which indicate that incompatible PBX on-hook impedance will even cause "pre-trip" or "false trip," and we therefore must conclude that these effects will not occur. Accordingly, we will not impose on-hook impedance limitations, in Section 68.312, on PBX equipment. We view this as a problem of compatibility of terminal equipment with telephone facilities, and again encourage the telephone com-

panies to provide equipment manufacturers with design specifications to which equipment can be designed.[9]

22. The great majority of ancillary and data equipment which is presently within the scope of Part 68 is connected to loop-start telephone facilities, whereas PBX equipment, depending upon the central office facilities of the serving telephone company, may be configured either for loop-start or ground-start operation. A loop-start trunk or line uses network control signaling which is compatible with a telephone set, while a ground-start trunk uses the intentional connection with earth ground of one trunk wire at the central office to indicate the start and end of a call, and the indirect connection of one trunk wire with earth ground at the PBX to sense this central office-end connection with earth ground (through PBX circuitry) as well as the direct connection of one trunk wire with earth ground at the PBX to indicate the start of an outgoing call. All of these intentional connections with earth ground are timed so that balance is maintained on the trunk when voiceband energy is present on the trunk in order that crosstalk does not result when the connections with earth ground are present. As a consequence of Bell's January 22 and March 1 filings in this proceeding, and of the comments thereon, many Part 68 requirements have been modified to accommodate the intentional connections with earth ground that

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[9] Section 68.110 imposes a requirement that telephone companies supply such information upon request for particular telephone facilities; general design specifications, in the nature of "Technical References" which have been supplied in the past, would effect compliance with this rule if sufficiently comprehensive. We would note that complex compatibility problems in connection of customer-provided PBXs have been handled in the past through "Technical Reference" specifications and not hardware protection, e.g., incoming call timing protocols, outgoing call timing protocols and disconnect sequences. *See* "Technical References": PUB 42401, March 1974, *Voice Connecting Arrangement CDH*, pp. 3-4, 8; PUB 42402, March 1974, *Voice Connecting Arrangements CD7, CD8 and CD9*, pp. 3-4, 8.

occur on ground-start facilities. Thus, most of the technical concerns which were expressed in the comments which we received on including PBX equipment have already been alleviated.[10] In this order, therefore, we shall only deal with those problems which remain, in light of the changed requirements of Part 68 as presently written.

23. *Longitudinal Surges.* Section 68.302(e) requires conformance to the technical standards of Part 68 after the application of surges with respect to earth ground. Since equipment intended for use on ground-start facilities will normally have circuitry which is intentionally connected with earth ground, the effect of this requirement might be to destroy such circuitry during testing. As in the case of our other environmental conditioning requirements, our rules provide that if such is the case, the equipment is still required to conform to the limitations of Sections 68.304-68.314, although it may be inoperative.

24. *Longitudinal Balance Limitations.* Section 68.310(d) requires that registered one-port terminal equipment present 40 dB of balance in the 200-4000 Hertz band in the off-hook state, when used with ground-start facilities. This recognizes that in the on-hook, or quiescent state, there is an intentional connection with earth ground which would cause the balance parameter to fall below 40 dB. Section 68.310(e) establishes balance requirements for registered protective circuitry used with loop-start facilities, but there is presently no concomitant standard for registered protective circuitry used with ground-start facilities. Accordingly, we shall adopt a new Section 68.310(f) which follows the language of Section 68.310(e), but which imposes the limitation presently applicable to Section 68.310(d).

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[10] Parties had indicated that the leakage current, longitudinal balance, on-hook impedance and hazardous voltage limitations would have to be changed to accommodate PBX trunks. In addition, concern was expressed that the signal power limitations, rigidly applied, would require additional components in telephone sets used with PBXs, unnecessarily.

25. *On-hook Impedance Limitations.* In accordance with our discussion in paragraphs 21 and 22 above, the introduction to subsection (a) will be modied to state "Limitations on individual equipment intended for parallel operation on loop-start telephone facilities, other than PBX equipment."

26. *Means of Connection.* We have received comments which indicate that plugs and jacks may not be appropriate for connection of PBX and key telephone equipment to the telephone network in view of the multiplicity of connections which would be involved. As was the case in our First Report and Order, we view this as a problem which appropriately should be addressed, in the first instance, by the parties who will be performing installation of such equipment. Accordingly, we will institute cooperative meetings between carriers and equipment manufacturers and installers, by a Public Notice to be released in the future, which will address suitable means of connection of PBX and key telephone equipment to the telephone network. We reserve the right to prescribe the use of plugs and jacks, or other suitable means of connection, in the event that such cooperative meetings are not fruitful.

27. *PBX and KT Installation Problems.* Unlike ancillary and data equipment and telephone sets, which are generally connected only to the telephone network and to no other equipment, PBX and KT systems consist of common equipment which is directly connected to the telephone network, and remote terminal equipment (such as telephone sets) which is indirectly connected to the telephone network through the common equipment. If protective circuitry is employed at the point of connection with the telephone network, then no harm can result from improper installation of wiring between the common equipment and remote equipment. However, if protective circuitry is not connected between such intra-system wiring and the common equipment, and there is no protective circuitry at the point of connection to the telephone network, then the network

is vulnerable to inadequate intrasystem wiring, and improper installation of such wiring.

28. Wiring is passive. It cannot, of itself, generate any signals. It can, however, become connected with earth ground or power lines through inadequate insulation, or marginally adequate insulation and improper installation. We have received no adequate proposals for certifying the installation of wiring. Even if we were to make the leakage current requirements applicable to intra-system wiring (which would assure adequate insulation), there still would be no assurance of adequate separation from power lines at the time of installation of such adequately-insulated wiring. Thus, we are faced with a quandary; the common equipment may be perfectly acceptable without protective circuitry, and yet leave the telephone network vulnerable to the vagaries of installation of wiring connected with the common equipment.

29. We have not received adequate recommendations for appropriately addressing this problem in the scope of the F.C.C. registration program. Therefore, we are requiring that (1) PBX and KT equipment be connected to the telephone network through protective circuitry at the point of connection with the telephone network which assures compliance with the hazardous voltage, longitudinal balance and leakage current requirements regardless of the design and installation of the common equipment and intrasystem wiring (in which case, no further information concerning the design of the common equipment need be furnished, except as noted below); or (2) that such protective circuitry be located within the common equipment such that it is electrically in the path of all wiring between the common equipment and remotely-located equipment (such as telephones),[11] or (3) PBX and KT equipment be

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[11] Many PBX designs already incorporate such circuitry as is called for under options (1) and (2), e.g., "repeat coil" PBXs.

connected to the telephone network through *fully* protective circuitry at the point of connection with the telephone network (in which case, there would be no limitation on the remote terminal equipment which might be connected through the intra-system wiring, except possibly for data equipment). In each of the first two alternatives (1) the common equipment may only be used with remotely located terminal equipment which itself is registered as conforming with the signal power requirements of Part 68, or which is connected to the remote end of the intra-system wiring through registered protective circuitry, and (2) information would have to be furnished concerning the loop current furnished remote equipment, to determine whether equipment registered as conforming to the signal power requirements when connected to a loop simulator circuit would similarly conform to these requirements as connected with the loop currents furnished by the common equipment. Since the Bell-initiated revised signal power limitations do not control in-band power for live voice acousto-electrical transducers (such as telephone sets), this approach will require no additional power limiting components to be added to PBXs if used only with remotely located telephone instruments.[12]

Conclusions

30. After reviewing the various arguments cited herein, we are of the view that no valid legal or technical basis has been advanced which would support the continued exclusion of main telephones, PBX and KT equipment from the scope of Part 68 of the FCC Rules. Such equipment has been connected to the telephone network since *Carterfone,* through connecting arrangements (telephone

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[12] We encourage submission of proposed rule changes which would assure proper installation of intra-system wiring and thereby preclude any unnecessary use of protective circuitry.

company-provided protective circuits), and Part 68 of the FCC Rules provides substantially equivalent assurance of nonharmful connection without the telephone company-provided connecting arrangements. Additionally, all of the conclusions of paragraph 16 of the First Report and Order are applicable to main telephones, PBX and KT equipment, and therefore the present requirement of connecting such equipment solely through telephone company-provided connecting arrangements is unlawfully restrictive of the customer's right to use the telephone network in a manner which is privately beneficial without being publicly harmful. Moreover, the present requirement of connecting such equipment solely through telephone company-provided connecting arrangements is unlawfully discriminatory for the reasons stated in paragraph 16 of the First Report and Order.

31. In addition, a registration program applicable to some equipment types, but not applicable to other equipment types, would appear to raise serious questions of discrimination between those subscribers who wish to connect harmless equipment within the scope of the registration program, and those subscribers who would wish to connect harmless equipment not included within the scope of the program. The technical discrimination between equipment types is also serious. Anomalously, equipment which is presently within the scope of Part 68 (e.g., datasets, which are typically connected with commercial power sources) actually may present a higher potential for harm than does equipment which is presently excluded (e.g., main telephones, which are connected with no power sources other than the telephone network itself). Such discrimination can simply not be sustained on technical "harm" grounds. Further, this discrimination becomes totally unsustainable in the case of main telephones (presently excluded) which are the same instruments as extension telephones (presently included).

32. The Part 68 technical requirements are applicable to main telephones, without modification, and to key telephone and PBX equipment, as modified herein. Main telephones, key telephone and PBX equipment which is registered in accordance with Part 68, or which is connected to the telephone network through protective circuitry registered in accordance with Part 68 will be privately beneficial without being publicly harmful. The requirements of Part 68 as modified herein will provide the requisite assurance of non-harmful connection of such equipment.

33. Main telephones, and PBX and key telephone equipment used in conjunction with the appropriate F.C.C. registered protective circuitry, and F.C.C. registered main telephones, and PBX and key telephone equipment may, following the effective date of this Order, be connected directly with the telephone network pursuant to the procedures set forth in the Part 68 rules, without benefit of carrier-supplied connecting arrangements. Carriers may continue to provide such connecting arrangements, if registered, and may require their use for equipment not registered with the F.C.C. or not used in conjunction with appropriate F.C.C. registered protective circuitry. Except as herein provided, carriers may not require the use of such connecting arrangements or other interface devices or arrangements for F.C.C. registered equipment or protective circuitry, and may not impose other tariff conditions contrary to the *Carterfone* policy without prior approval of the Commission.

Order

34. It Is Ordered, pursuant to Sections 4(i), 4(j), 201-205, 208, 215, 218, 313, 403, 404, 410 and 602 of the Communications Act, That Part 68 of the Commission's Rules and Regulations is amended as shown in the appendix hereto, effective May 1, 1976.

35. It Is Further Ordered, That this proceeding is Terminated.

Federal Communications Commission,
Vincent J. Mullins, *Secretary.*

Appendix

The Commission's Rules and Regulations (Chapter I of Title 47 of the Code of Federal Regulations) are amended as follows:

Section 68.2 is amended as follows:

Section 68.2 *Scope*

(a) Except as provided for in paragraphs (b) and (c), the rules and regulations in this Part apply to the direct connection after May 1, 1976 of all terminal equipment other than coin telephones, and PBX and key telephone equipment to the telephone network, for use in conjunction with all services other than party line service, and to the direct connection after August 1, 1976 of all terminal equipment other than coin telephones to the telephone network, for use in conjunction with all services other than party line service.

(b) Unless otherwise ordered by the Commission, all items of equipment, other than PBX and key telephone equipment, of a type directly connected to the network as of May 1, 1976 may be connected thereafter up to January 1, 1977—and may remain connected for life—without registration, unless subsequently modified.

(c) Unless otherwise ordered by the Commission, all PBX and key telephone equipment of a type

directly connected to the network as of August 1, 1976 may be connected thereafter up to January 1, 1977—and may remain connected for life—without registration, unless subsequently modified.

Section 68.310 is amended as follows:

Section 68.310 *Longitudinal Balance Limitations*

(a) *Technical Description and Application.* The metallic-to-longitudinal balance coefficient, BALANCE$_{m\text{-}l}$ is expressed as:

$$\text{BALANCE}_{m\text{-}l} = 20 \log_{10} \left| \frac{e_M}{e_L} \right|$$

where e_L is the longitudinal voltage produced across a 500-ohm longitudinal termination and e_M is the metallic voltage across the tip-ring interface of the input port when a voltage (at any frequency $200 < f < 4000$ Hertz) is applied from a balanced 600-ohm metallic source. The source voltage should be set such that $e_M = 0.775$ volts rms (0 dBm) when a 600-ohm termination is substituted for the terminal equipment. The minimum balance coefficient shall be equalled or exceeded at all values of dc loop current that the port under test of the registered equipment is capable of drawing when attached to the loop simulator circuit specified in these Rules. A test circuit that satisfies the above conditions and may be used for measuring the metallic-to-longitudinal balance coefficient is shown in Figure 68.310(a). The minimum balance requirements specified below shall be equalled or exceeded under all reasonable conditions of the application of earth ground to the registered equipment:

Sub-paragraph	Equipment state	Minimum balance requirement	Frequency range (Hertz)
(b)	Both on-hook and off hook.	60 dB 40 dB	200 to 1000 1000 to 4000
(c)	on-hook	60 dB 40 dB	200 to 1000 1000 to 4000
	off-hook	40 dB	200 to 4000
(d)	off-hook	40 dB	200 to 4000
(e) voice equipment	Both on-hook and off-hook	60 dB 40 dB	200 to 1000 1000 to 4000
(e) data equipment	on-hook	60 dB 40 dB	200 to 1000 1000 to 4000
	off-hook	40 dB	200 to 4000
(f)	off-hook	40 dB	200 to 4000
(g)	Both on-hook and off-hook	60 dB 40 dB	200 to 1000 1000 to 4000
(h)	off-hook	40 dB	200 to 4000

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(f) *Registered Protective Circuitry for Ground-Start Applications.* These criteria shall be met with either terminal of the interface to other equipment connected to earth ground. The interface to other equipment shall be terminated in an impedance which will be reflected to the telephone connection as 600-ohms in the off-hook state of the registered protective circuit. Figure 68.310(e) shows the interface of the protective circuitry being tested and the required arrangement at the interface to other equipment.

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Section 68.312(a) is amended as follows:

Section 68.312 *On-Hook Impedance Limitations*

(a) Limitations on individual equipment intended for parallel operation on loop-start telephone facilities, other than PBX equipment:

DISSENTING STATEMENT OF
COMMISSIONER BENJAMIN L. HOOKS

In Re: Docket No. 19528 (PBX Interconnection)

We should not be extending the registration requirement to PBX equipment without first having examined the social and economic impact of this decision. I expressed similar views in *Mebane Home Telephone Company*, 53 FCC 2d 473, 484 (1975) (dissenting opinion), and in my separate statement concurring in the *First Report and Order* in this Docket, 56 FCC 2d 593, 622 (1975). I see a clear difference between PBX and "data and ancillary devices," as the latter term was used in the *First Report and Order*. Answering systems, computers and their associated terminal equipment are not the traditional service offerings of telephone companies although admittedly they may be closely related, functionally and in design, to more familiar apparatus. "Data and ancillary devices" are new conceptions, which generally do not offer—except, perhaps, for extension telephones—direct competition with the long-standing service offerings of telephone companies. Given a policy judgment that free competition in data and ancillary services will promote the public interest, the registration requirement established in the *First Report and Order* provides one method of safeguarding the switched network from technical harm, although more effective methods may certainly exist.

But how does one distinguish between newfangled terminal equipment and, for example, an extension telephone or any other traditional telephone equipment? The

short answer is that one cannot distinguish on technical basis alone. Despite an apparent intuitive distinction between old-fashioned devices like extension telephones and modern-day exotica like an IBM 370/168, there are, technically, very few apparent grounds for making any distinction. Accordingly, in the *First Report and Order*, we applied the registration requirement to all equipment connected to subscriber loops, including extension telephones. I was dubious about taking this decision until our studies on the economic impact of interconnection were completed;[1] but I also recognized that the boundary between extension telephones, on the one hand, and innovative terminal equipment on the other was difficult and should be addressed more fully in another context. In light of this practical difficulty, I concurred in the *First Report and Order*.

But today we take a further step, in which the practical distinctions that dogged the *First Report and Order* do not appear. Most PBX equipment is not connected to ordinary customer loops. It is connected directly to carrier trunks. Hence, it can be distinguished, at least technically, from both extension telephones and data and/or ancillary

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[1] In my dissent in *Mebane, supra*, I cited some of the initial comments in Docket No. 20003. More comments having been filed, it becomes obvious that reconciliation of the various self-interested studies, the methodologies and conclusions therein, will be impossible; so acute are the divergencies. Even the Commission, which is all but irreversibly down the road with its policies (this instant action being merely the latest manifestation) cannot be said to be wholly neutral on the outcome of Docket 20003. Accordingly, because the social and economic issues loom so large with respect to our communications system, I doubt that I or the public can be satisfied with anything but an independent analysis of the issues by a disinterested, qualified observer, *e.g.*, a "think tank" which is not financially or ideologically tethered to the views of the participating parties. It is not a question of not trusting the analysis of the present protagonists, private or governmental. But, where I come from we have an expression: "Trust your sister—but cut the cards."

terminal gear. While the *First Report and Order* could be justified as further opening the door to growth in new and innovative communications services by creating comprehensive rules for terminal interconnection, today's decision cannot be explained on that ground. Although it may lead to rearrangements of existing network facilities, and correlatively of existing rate structures, the application of the registration requirement to PBX seems less likely to produce new innovation and growth in the short run, and probably would have an immediate detrimental impact on the cost and availability of telephone service to the public. At least from our present situation of limited and incomplete information on the general economic effects of our interconnect policies on the efficiencies of operating a telephone company, the risk of such detrimental impact is unacceptably great in the context of the present case, considering the relative costs and benefits.

I must emphasize that the Commission, if it followed my counsel of caution on this matter, would in no way be acting to the prejudice of any future action it might wish to take. I do not suggest that it would never be appropriate to do what the majority does today; I only say that it would make more sense to keep our options open.

One further point requires mentioning. In my separate statement concurring in the *First Report and Order*, I said that I doubted the efficiency and good sense of applying the registration program to carrier-supplied equipment. Carriers have no reason to design equipment which will snarl the switched network, and every reason not to. My views on this matter have not changed; this application of the registration program still does not make sense.

For the foregoing reasons, therefore, I respectfully dissent.